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# BPA linked to obesity risk in puberty-age girls

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Girls between 9 and 12 years of age with higher-than-average levels of bisphenol-A (BPA) in their urine had double the risk of being obese than girls with lower levels of BPA, according to a Kaiser Permanente study published today in the journal *PLOS ONE*.

"This study provides evidence from a human population that confirms the findings from animal studies—that high BPA exposure levels could increase the risk of overweight or obesity," said De-Kun Li, MD, PhD, principal investigator of the study and a reproductive and perinatal epidemiologist at the Kaiser Permanente Division of Research in Oakland, Calif.

BPA is used to make plastics and other materials, such as cash register receipts. It is a known endocrine disruptor with estrogenic properties. In children and adolescents, BPA is likely to enter the body primarily through the ingestion of foods and liquids that have come into contact with BPA-containing materials, Dr. Li said.

"Girls in the midst of puberty may be more sensitive to the impacts of BPA on their energy balance and fat metabolism," Dr. Li said. While BPA is still being examined, he said it has been shown to interfere with a body's process of relating fat content and distribution.

The study—the first specifically designed to examine the relationship between BPA and obesity in school-age children—was conducted in Shanghai as part of a larger national study of puberty and adolescent

health.

Dr. Li and colleagues studied 1,326 male and female children in grades 4 to 12 at three Shanghai schools (one elementary, one middle and one high school). In addition to urine samples collected with BPA-free materials, they obtained information on other risk factors for childhood obesity, such as dietary patterns, physical activity, mental health and family history.

The researchers found that in girls between 9 and 12 years old, a higher-than-average level of BPA in urine (2 micrograms per liter or greater) was associated with twice the risk of having a body weight in the top 10th percentile for girls of their age in the same population.

The impact was particularly pronounced among 9- to 12-year-old girls with extremely high levels of BPA in their urine (more than 10 micrograms per liter): their risk of being overweight (in the top 10th percentile) was five times greater.

The researchers did not identify significant BPA effects in any other groups studied, including girls over 12 years of age and boys of all ages.

Among all the 9- to 12-year-old girls studied, 36 percent of those with a higher-than-average level of BPA in their urine were overweight or obese compared with 21 percent of those with a lower-than-average level of BPA.

"Our study suggests that BPA could be a potential new environmental obesogen, a chemical compound that can disrupt the normal development and balance of lipid metabolism, which can lead to obesity," Dr. Li and co-authors wrote in *PLOS ONE*. "Worldwide exposure to BPA in the human population may be contributing to the worldwide obesity epidemic."

The *PLOS ONE* study is the latest in a series published by Dr. Li and his colleagues examining the effects of BPA in humans:

- A 2009 study in *Human Reproduction* found that exposure to high levels of BPA in the workplace increased the risk of sexual dysfunction in men.
- A 2010 study in the *Journal of Andrology* found that increasing BPA levels in urine were associated with worsening male sexual function.
- A 2011 study in the journal *Fertility and Sterility* showed that increasing urine BPA levels were significantly associated with decreased sperm concentration, decreased total sperm count, decreased sperm vitality and decreased sperm motility.
- A 2011 study in the Journal of Reproductive Toxicology showed that parental exposure to BPA during pregnancy was associated with decreased birth weight in offspring.
- A 2011 study in *Birth Defects Research* (Part A) found that in-utero exposure to BPA was related to anogenital distance (the physical distance between the anus and the genitalia) in male offspring.
- A 2013 study in *Fertility and Sterility* showed that male workers exposed to BPA in a chemical plant for 6 months or more had lower testosterone levels in their blood than with those who were not exposed to BPA in workplace.

Kaiser Permanente is committed to researching and sourcing safer alternatives to products that may contain potentially harmful chemicals such as BPA. To that end, Kaiser Permanente's Sustainability Scorecard for Medical Products requires suppliers and manufacturers to disclose the presence of BPA in products. Most recently, the organization was able to eliminate BPA from packaging of supplemental nutrition and infant formula products.

Provided by Kaiser Permanente